**Fenrir Flight 27:**
Video can be found here:

- Front truck cam: https://www.flickr.com/photos/100936386@N02/18502125118/in/dateposted-public/
- Rear truck cam: https://www.flickr.com/photos/100936386@N02/18502382700/in/dateposted-public/
- Flare: https://www.flickr.com/photos/100936386@N02/18066067004/in/dateposted-public/

The goal for this flight was to launch the aircraft and have the pilot fly circuits by commanding phi and theta angles via the sticks. Auto throttle ran the entire flight. After climbing during the first circuit, on the first straight pass, the pilot engaged our approach guidance and zdot tracker which holds a 3 m/s descent rate and drops airspeed to 20 m/s while letting the pilot control phi angle to keep the aircraft aligned with the runway. The approach guidance and tracker appeared to work flawlessly, so on the second pass we had the pilot engage the approach guidance and fly it to an altitude of about 10 - 12 feet AGL, when he engaged flare guidance, which reduces the descent rate to 0.5 m/s, reduces speed to 15 m/s, and holds wings level. The automated approach and landing performed extremely well. Looking at the data our touchdown descent rate was around 1 m/s, airspeed 16 m/s, and slightly nose up. From a quick look at the data, tracking on all control loops performed well. There wasn't quite enough time in flare to bring bank angle to zero.

Gains for this flight were:

- static double roll_gain[3]  = {0.50,0.15,0.01};  // PI gains for roll tracker and roll damper
- static double pitch_gain[3] = {-0.3,-0.40,-0.01};  // PI gains for theta tracker and pitch damper
- static double v_gain[2]     = {0.091, 0.020};        // PI gains for speed tracker
- static double zdot_gain[2]  = {-0.025,-0.05};        // PI gains for zdot tracker

Prior to the flight, we removed the roll trim and reduced the pitch trim to 4 degrees from 7 degrees based on pilot feedback and a quick look at the data.